

The Claims Defining the Invention are as Follows

1. A core orientation device for a core drill, the device comprising: an arrangement for providing signals associated with a physical orientation of the core orientation device; processing means for processing the signals provided
5 by the arrangement so as to provide processed data from which a measure of the physical orientation of the core orientation device can be established, the measure being associated with the physical orientation of the device at a particular moment in time; memory for storing the processed data; and interface means having first means for storing the processed data in the
10 memory and second means for accessing the memory to provide the measure of the physical orientation of core orientation device when required.
2. A core orientation device as claimed in claim 1 wherein the physical orientation of the core orientation device comprises a rotational orientation about a longitudinal axis of the core orientation device.
- 15 3. A core orientation device as claimed in claim 1 or 2 wherein the physical orientation of the core orientation device comprises an angular orientation of the longitudinal axis above or below the horizontal plane.
- (4. A core orientation device as claimed any one of claims 1 to 3 wherein the arrangement for providing signals comprises triaxial accelerometer means.
- 20 5. A core orientation device as claimed any one of claims 1 to 4 wherein the core orientation device includes means for relating the measure of the orientation of the core orientation device with the present orientation thereof such that the core orientation device can be rotated to reflect the measure of the orientation of the core orientation device.
- 25 6. A core orientation device as claimed any one of claims 1 to 5 wherein the core orientation device includes input means for inputting the particular moment in time into the processing means and display means for subsequently

displaying the measure of the physical orientation of the device, the measure being associated with the inputted moment in time.

- 5 7. A core orientation device as claimed in claim 6 wherein the core orientation device is cylindrical and one end of the core orientation device includes the display and input means in the form of a LCD display and keypad.
8. A core orientation device as claimed any one of claims 1 to 7 wherein the core orientation device has a body in the form of a housing having at least one threaded end for being engaged by an inner tube assembly of the core drill.
- 10 9. A core orientation device as claimed in claim 8 wherein, when engaged by the inner tub assembly, the core orientation device forms a length of the inner tube assembly.
- 15 10. A core orientation device as claimed any one of claims 1 to 9 wherein the processing means includes a timer configured for ensuring that the processing means processes signals from the arrangement over predetermined time intervals.
11. A core orientation device as claimed any one of claims 1 to 10 wherein the processor means includes integration means for integrating signals from the arrangement over a predetermined time interval.
- 20 12. A core orientation device as claimed any one of claims 1 to 11 wherein the processor means includes timer means for determining predetermined intervals relative to a reference time, and means for storing the processed data in the memory upon each of the predetermined intervals terminating.
- 25 13. A core drill having a core orientation device comprising: an arrangement for providing signals associated with a rotational orientation of the core orientation device; processing means for processing the signals provided by the arrangement so as to provide processed data from which a measure of the rotational orientation of the core orientation device can be established, the

- measure being associated with the rotational orientation of the device at a particular moment in time; memory for storing the processed data; and interface means having first means for storing the processed data in the memory and second means for accessing the memory to provide the measure of the rotational orientation of core orientation device when required; wherein the core drill comprises: means for maintaining knowledge of the relative rotational orientation of a core drilled by the core drill and the core orientation device such that a measure of the rotational orientation of the core can be established using the measure of the rotational orientation of the core orientation device.
14. A core drill as claimed in claim 13 wherein the means for maintaining knowledge of the relative rotational orientation of the core drilled by the core drill comprises a mechanism for preventing rotational movement about the length of the core sample, relative to the core orientation device.
15. A core drill as claimed in claim 13 or 14 including means for relating the measure of the orientation of the core orientation device with the present orientation thereof such that the core orientation device can be rotated to reflect the measure of the orientation of the core orientation device.
16. A core drill as claimed in any one of claims 13 to 15 wherein the core drill includes an outer tube assembly and an inner tube assembly with the inner tube assembly having a means for accommodating the core orientation device along the length of the inner tube assembly.
17. A core drill as claimed in claim 16 wherein the inner tube assembly includes a bearing allowing the means for accommodating the core orientation device to rotate relative to the outer tube assembly but not relative to the core sample when the core is received by the inner tube assembly.
18. A core drill as claimed in claim 16 or 17 wherein the core orientation device is cylindrical and one end of the core orientation device includes display and input means in the form of a LCD display and keypad, the end of the core

orientation device being protected by the inner tube assembly when accommodated.

19. A core drill as claimed in any one of claims 16 to 18 wherein the outer tube assembly includes a spacer for allowing the inner tube assembly to be fitted with the outer tube assembly when the core orientation device is accommodated.
20. According to a third aspect of the invention there is provided a method of obtaining and orientating a core sample comprising:
- moving a core drill having a core orientation device from a first location to a drilling location and thereafter operating the core drill to drill a core sample;
 - generating signals associated with a physical orientation of the core orientation device between the first location and the drilling location;
 - processing the signals to provide processed data from which a measure of orientation of the core orientation device at the drilling location can be established; and
 - storing the processed data in memory such that the measure of the physical orientation of the core orientation device can be obtained therefrom.
21. A method as claimed in claim 20 wherein the method includes maintaining knowledge of the relative physical orientation of the core orientation device and the core sample after the core sample has been drilled such that a measure of the orientation of the core sample taken by the core drill can be provided using the measure of the orientation of the core orientation device when at a location spaced from the drilling location.
22. A method as claimed in claim 20 or 21 wherein the method includes initialising the orientation of the core orientation device at the first location, said initialising being performed by commencing said generating and processing the signals at the first location with the core orientation device in a known orientation.

23. A method as claimed in any one of claims 20 to 22 wherein the method includes displaying a related measure of the orientation of the device and varying that measure upon rotation of the core sample and device such that a user can position the core sample and device in the measured orientation for marking.
24. An orientation device for providing an indication of the orientation of a core sample relative to a body of material from which the core has been extracted, the orientation device comprising means for determining and storing the orientation of the device at predetermined time intervals relative to a reference time, means for inputting a selected time interval, means for relating the selected time interval to one of the predetermined time intervals and providing an indication of the orientation of the device at the selected time interval.
25. An orientation device as claimed in claim 24 attached to an inner tube assembly of a core drill and fixed against rotation relative thereto, the orientation device including means for attachment to the inner tube assembly.
26. An orientation device as claimed in claim 24 or 25 including means for comparing the orientation of the device at the selected time interval to the orientation of the device at any subsequent time and providing an indication of the direction in which the device should be rotated in order to bring it into an orientation corresponding to the orientation of the device at the selected time.
27. An orientation device for providing an indication of the orientation of a core sample relative to a body of material from which the core sample has been extracted, the orientation device comprising means for generating signals responsive to the orientation of the device, a processor for receiving the generated signals and for processing the signals to generate orientation data representative of the orientation of the device, means for storing the orientation data at predetermined time intervals, means for inputting a signal representative of a selected time interval to the processor, the processor operating to relate the selected time interval to the predetermined time

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intervals and output a signal indicative of the orientation of the device at the selected time interval.

28. An orientation device as claimed in claim 27 wherein data is generated representative of the orientation of the device at any subsequent time and the processor is operable to output a signal to a display means to provide a visual indication of the direction in which the device should be rotated at said subsequent time in order to bring the device into an orientation corresponding to its orientation at the selected time.

29. A core drill comprising an inner tube assembly and an orientation device according to claim 24.

30. A core drill comprising an inner tube assembly and an orientation device according to the claim 27.

31. A method of providing an indication of the orientation of a core sample relative to a body of material from which the core sample has been extracted, the method comprising: drilling a core sample from a body of material with a core drill having an inner tube assembly; recording the orientation of the inner tube at predetermined time intervals with reference to an initial reference time during said drilling; recording the specific time interval beyond the reference time at which the core sample was separated from the body of material; removing the inner tube assembly and core sample contained therein from the body of material; and relating the recorded specific time to the recorded time intervals to obtain an indication of the orientation of the inner tube and consequently the core contained therein at the specific time interval.

32. A device substantially as herein described with reference to the accompanying drawings.

33. A method substantially as herein described with reference to the accompanying drawings.